

WHAT IS CLAIMED IS:

1 1. A polymer nanocomposite, comprising:
2 60~99 wt % of high molecular substrate;
3 0.5~30 wt% of layer structured inorganic, well dispersed,
4 coated evenly on the high molecular substrate; and
5 0.5~30 wt % of polyelectrolyte, which carries the opposite
6 charge of the layer-structured inorganic material and it is
7 attached onto the layer-structured inorganic material.

1 2. The polymer nanocomposite as claimed in claim 1, wherein
2 the high molecular substrate is selected from the group consisting
3 of styrene-butadiene rubber, isopiperylene rubber, butadiene
4 rubber, acrylonitrile-butadiene rubber, natural rubber, PVC, PS,
5 PMMA, PU and combinations thereof.

1 3. The polymer nanocomposite as claimed in claim 2, wherein
2 the original state of the high molecular substrate is latex.

1 4. The polymer nanocomposite as claimed in claim 3, wherein
2 the latex is styrene-butadiene rubber latex and PMMA latex.

1 5. The polymer nanocomposite as claimed in claim 1, wherein
2 the layer-structured inorganic material is selected from clay,
3 and its cationic ion exchange equivalent is between 30 and 200
4 meq/100g.

1 6. The polymer nanocomposite as claimed in claim 5, wherein
2 the layer-structured inorganic material is selected from the group
3 consisting of smectite clay, vermiculite, halloysite, sericite

4 and fluoro-mica.

1 7. The polymer nanocomposite as claimed in claim 6, wherein
2 the smectite clay is selected from the group consisting of
3 montmorillonite, saponite, beidellite, nontronite, hectorite and
4 stevensite.

1 8. The polymer nanocomposite as claimed in claim 1, wherein
2 the polyelectrolyte is cationic polyelectrolyte.

1 9. The polymer nanocomposite as claimed in claim 8, wherein
2 the cationic polyelectrolyte is selected from the group consisting
3 of poly(diallyl dimethylammonium chloride), poly (4-vinyl
4 pyridine) and combinations thereof.

1 10. The polymer nanocomposite as claimed in claim 9, wherein
2 the total charge mole number of the polyelectrolyte is 1 to 10
3 times that of the layer-structured inorganic material.

1 11. A method of preparing a polymer nanocomposite, comprising
2 the steps of:

3 (a). combining a layer structured inorganic solution with a
4 polyelectrolyte solution to obtain a mixture solution, the
5 polyelectrolyte has opposite and over amount of charges with
6 respect to the layer-structured inorganic material, which the
7 polyelectrolyte is attached on the layer-structured inorganic
8 material; and

9 (b). combining the obtained mixture solution with a polymer
10 latex, the polymer latex carries opposite charges with respect
11 to the polyelectrolyte, by way of co-agglutination, a layer-

12 structured inorganic/polyelectrolyte/polymer nanocomposite is
13 obtained.

1 12. The method as claimed in claim 11, wherein the solution
2 includes organic solvents.

1 13. The method as claimed in claim 11, wherein the polymer
2 latex is selected from the group consisting of styrene-butadiene
3 rubber, isopiperylene rubber, butadiene rubber,
4 acrylonitrile-butadiene rubber, natural rubber, PVC, PS, PMMA,
5 PU and combinations thereof.

1 14. The method as claimed in claim 13, wherein the polymer
2 latex is styrene-butadiene rubber latex and PMMA latex.

1 15. The method as claimed in claim 11, wherein the layer-
2 structured inorganic material is selected from clay, and its
3 cationic ion exchange equivalent is between 30 and 200 meq/100g.

1 16. The method as claimed in claim 15, wherein the layer-
2 structured inorganic material is selected from the group
3 consisting of smectite clay, vermiculite, halloysite, sericite
4 and fluoro-mida.

1 17. The method as claimed in claim 16, wherein the smectite
2 clay is selected from the group consisting of montmorillonite,
3 saponite, beidellite, nontronite, hectorite and stevensite.

1 18. The method as claimed in claim 11, wherein the
2 polyelectrolyte is cationic polyelectrolyte.

1 19. The method as claimed in claim 18, wherein the cationic
2 polyelectrolyte is selected from the group consisting of
3 poly(diallyl dimethylammonium chloride), poly (4-vinyl pyridine)
4 and combinations thereof.

1 20. The method as claimed in claim 9, wherein the total charge
2 mole number of the polyelectrolyte is 1 to 10 times that of the
3 layer-structured inorganic material.

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